

STUDIES IN THE HELIANTHEAE (ASTERACEAE). XIX.

FOUR NEW SPECIES OF CALEA FROM BRASIL.

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Recent efforts to identify specimens of Calea from Bahia have resulted in the recognition of the following four previously undescribed species from Brasil. All four species share the characters of the broad but natural concept of Calea that excludes Alloispermum Willd. (Robinson, 1978). The achenes are prismatic without striations, the pappus is radially symmetrical with numerous squamae, the disk corolla lobes are smooth with reddish ducts along the margins which join at the sinuses, and the anthers are yellowish. Disk corolla lobes of the genus are often elongate, but some Brazilian species have lobes scarcely longer than wide. Two of the new species lack paleae and are technically members of Geissopappus which has been placed in the synonymy of Calea by Robinson (1975). It should be noted that some of the traditional species of Calea in Brasil such as C. pilosa Baker of Bahia, lack paleae and should have been placed in Geissopappus. While the epaleaceous species seem to form a somewhat unnatural group, it is notable that they are all from the Guiana area or from eastern Brasil, and they all have short pappus squamae, none having the long aristae that are most common elsewhere in the genus.

Calea eitenii H. Robinson, sp. nov.

Plantae herbaceae perennes ascendentiter ramosae ca. 30 cm altae. Caules teretes subcarnosi in sicco rugulosi. Folia opposita, sessilia vel subsessilia; laminae inferne 2-5-lobatae in marginis lobarum integrae apice obtusae vel breviter acutae supra superne et fere ad marginem scabridulae subtus subcarnosae et distincte glandulo-punctatae. Inflorescentiae unicapitatae longe pedunculatae, pedunculis 10-15 cm longis superne antrorse scabridis. Capitula late campanulata 10-12 mm alta sine radiis ca. 12-15 mm lata. Squamae involucri bifformes, exteriores herbaceae ca. 4 late oblongae vel suborbiculares 3-6 mm longae apice rotundatae margine superne reflexae base raro lobatae intus fere ad marginem scabridulae extus subcarnosae glandulo-punctatae, squamae interiores fusco-virides interdum marginaliter rubrescentes papyraceae subimbricatae late oblongae 7-12 mm longae et 4-5 mm latae apice late rotundatae margine anguste distincte scariosae extus glabrae, canalis resiniferis 7-11; paleae scariosae anguste lanceolatae vel lineares 6-7 mm longae apice anguste acutae. Flores radii ca. 12; corollae flavae, tubis ca. 3 mm

longis glabris, limbis anguste oblongis ca. 13 mm longis et 3 mm latis extus distincte glandulo-punctatis apice distincte trilobatis, lobis plerumque retusis. Flores disci 20-25; corollae flavae 5.5-6.5 mm longae extus glabrae, tubis subdistinctis 1.0-1.5 mm longis, faucis anguste campanulatis 2.5-3.0 mm longis, lobis ca. 1.0 mm longis et 0.7 mm latis; thecae antherarum ca. 2.5 mm longae; appendices antherarum ovatae ca. 0.4 mm longae et 0.33 mm latae extus glanduliferae. Achaenia 2.5-3.0 mm longa plerumque in costis breviter setifera inferne leniter angustiora; squamae pappi ca. 14-16 anguste lanceolatae vel lineares aristatae plerumque 4-5 mm longae margine serrulatae vel erosae extus laeves. Grana pollinis ca. 35 μ m in diam. spinulosa.

TYPE: BRASIL: Minas Gerais: Município de Jaboticatubas: Serra do Cipó. Along road at km 121. 19°18-19'S. 43°35'W. Alt. ca. 1200 m. Flat grassy meadow on thin soil derived from quartzite ("itacolomite"). Rays golden-yellow. Disk flowers with yellow petals and orange to brown anthers. 25 Nov. 1965. G. & L.T. Eiten 6891 (Holotype US).

Both *Calea eitenii* and the following *C. kirkbridei* initially seem close to *C. multiplinervia* Less. because of the solitary long-pedunculate heads and the narrow leaves or leaf-segments. The latter species differs, however, by the prominent longitudinal veins of the leaf which extend fully into the petioliform base, and by the long pilosity of the stems and leaf veins. The two new species actually seem closest to each other, but *C. eitenii* is notably distinct in the dissection that is evident in the leaves, the tips of the rays, and sometimes in the basal lobes of the outer involucre bracts. Also, *C. kirkbridei* lacks the herbaceous outer bracts of the involucre and lacks glands on the rays or anther appendages.

Calea kirkbridei H. Robinson, sp. nov.

Plantae herbaceae perennes erectae non vel pauca ramosae ca. 0.5 m altae. Caules brunnescentes vel rubrescentes subhexagonales glabri. Folia opposita sessilia; laminae anguste oblongae vel lineares 1.0-5.5 cm longae et 2.0-4.5 mm latae base anguste cuneatae margine integrae apice breviter acutae utrinque glabrae subtus subcarnosae fere ad basem obscure ascendenter trinervatae. Inflorescentiae unicapitatae longe pedunculatae, pedunculis ca. 20 cm longis superne antrorse scabridis. Capitula late campanulata ca. 1 cm alta sine radiis ca. 1.0-1.2 cm lata. Squamae involucri ca. 15 brunnescentes subcoriaceae exteriores subherbaceae subaequales oblongae vel anguste oblongae 6-9 mm longae et 2-4 mm latae apice rotundatae vel obtusae margine anguste scariosae minute sparse puberulae extus base puberulae superne glabrae, canalis resiniferis 5-7; paleae scariosae lanceolatae ca. 8 mm longae apice breviter acutae. Flores radii ca. 8; corollae flavae glabrae, tubis 2.5-3.0 mm longis, limbis oblongis 11-12 mm longis et 4.0-4.5 mm latis. Flores disci ca. 20; corollae flavae 5.0-5.5 mm longae extus glabrae, tubis sub-

distinctis ca. 1.5 mm longis, faucis anguste campanulatis ca. 2.5 mm longis, lobis 1.0-1.5 mm longis et ca. 1.0 mm latis; thecae antherarum 1.8-2.0 mm longae; appendices antherarum ovatae ca. 0.4 mm longae et 0.3 mm latae extus non glanduliferae. Achaenia 4.0-4.5 mm longa plerumque in costis breviter setifera inferne angustiora; squamae pappi ca. 12 anguste lanceolatae aristatae 3-4 mm longae margine serrulatae vel erose denticulatae extus persparse papillosae. Grana pollinis 30-32 μ m in diam. spinulosa.

TYPE: BRASIL: Minas Gerais: Serra do Espinhaço. Eastern slopes of Pico do Itambé, first large sandstone outcrops below the summit; elev. ca. 1700 m; sandstone and adjacent meadows, with both sandy soil and overlying humus. 11 Feb. 1972. W.R.Anderson, M.Stieber & J.H.Kirkbride Jr. 35792 (Holotype US).

For the distinctions of the species see the discussion under C. eitenii.

Calea harleyi H.Robinson, sp. nov.

Plantae suffrutescentes ascendenter ramosae ca. 50 cm altae. Caules rubrescentes hexagonales inferne sensim teretes sparse minute scabriduli glabrescentes. Folia opposita, petiolis 2-5 mm longis indistinctis; laminae anguste ellipticae plerumque 3.0-4.5 cm longae et 0.4-1.0 cm latae base anguste cuneatae margine utrinque 2-3 (4) -serratae apice anguste acutae supra minute scabridulae in nervo primario prominentes subtus subcarnosae glandulopunctatae plerumque in nervis sparse scabridulae fere ad basem ascendenter trinervatae. Inflorescentiae in ramis terminales tricapitatae vel subumbellatae, ramis plerumque 5-17 mm longis scabridulis. Capitula campanulata 8-10 mm alta et 4.5 mm lata; squamae involucri ca. 18 flavescens vel brunnescentes subcoriaceae exteriores non herbaceae subimbricatae minute ovatae vel late oblongae 1.5-7.0 mm longae et 1.5-3.5 mm latae apice rotundatae margine distincte anguste scariosae extus glabrae, canalis resiniferis plerumque 9-11; paleae nullae. Flores radii nulli. Flores disci ca. 10; corollae flavae ca. 4 mm longae extus glabrae, tubis distinctis ca. 1.5 mm longis, faucis campanulatis ca. 1 mm longis, lobis ca. 1.5 mm longis et 0.8 mm latis; thecae antherarum ca. 1.5 mm longae; appendices antherarum ovatae ca. 0.4 mm longae et 0.25 mm latae extus glanduliferae. Achaenia 3.0-3.5 mm longa sparse scabrida; squamellae pappi ca. 12 ca. 0.5 mm longae et 0.4 mm latae margine et apice erose denticulatae extus papillosae. Grana pollinis ca. 27 μ m in diam. spinulosa.

TYPE: BRASIL: Bahia: Serra do Sincorá. ca. 6 km N. of Barra da Estiva on Iboara road. Grassland with low shrubs and scattered woodland. Alt. ca. 1100 m. Approx. 41°18'W, 13°35'S. Decumbent subshrub. Flowers yellow, ray florets absent. 29 Jan. 1974. R.M.Harley, S.A.Renvoize, C.M.Erskine, C.A.Brighton & R.Pinheiro 15586 (Holotype US). PARATYPES: BRASIL: Bahia: Serra do Sincorá. ca. 14 km N. of Barra da Estiva, near the Iboara road. Mixed vegetation with low scrub and dry grassland, and scattered woodland, occasionally disturbed or burnt-over. Alt.

1100 m. Approx. 41°18'W. 13°35'S. Low subshrub with ascending stems. Capitula yellow, flowers yellow. 2 Feb. 1974. Harley et al. 15842 (US); Serra do Rio de Contas. 10 km N. of town of Rio de Contas on road to Mato Grosso. Woodland along small stream, normally damp grassland, now dry, and dry cerrado/carrasco woodland on slopes of surrounding quartzitic hills. Alt. ca. 1000 m. Approx. 41°50'W. 13°28'S. Subshrub with swollen woody root to ca. 50 cm. Phyllaries yellow, florets yellow. 19 Jan. 1974. Harley et al. 15266 (US); Serra da Agua de Rega. Cerrado, ca. 24 km N. of Seabra, road to Agua de Rega, ca. 1000 m elev. Ascending herb, the stems to ca. 50 cm long. 25 Feb. 1971. H.S. Irwin, R.M. Harley & G.L. Smith 31073 (US).

Calea harleyi has a resemblance to *C. hypericifolia* Baker of Goyas, but the latter differs in numerous details and does not seem closely related. The leaves of the Goyas species are not as pointed and are not toothed, the midvein of the leaf is not prominent above, the hairs of the stems and leaves are longer and more slender, the glands on the leaf-undersurface are smaller and more superficial, the head has larger herbaceous bracts at the base, rays are present, and the pappus squamae are smaller. Actually, there is closer relationship to *C. pinheiroi* described below, but that has broader leaves with a less carnosose undersurface and less prominent veins on the upper surface, the hairs of the stems and leaves are denser and longer, and the individual parts of the inflorescence show two orders of branching with the ultimate branches short.

Calea pinheiroi H. Robinson, sp. nov.

Plantae suffrutescentes multo ramosae ad 25 cm altae. Caules brunnescentes inferne teretes et obscure striati superne hexagonales hispiduli. Folia opposita, petiolis 3-5 mm longis; laminae ovatae plerumque 1.5-2.5 cm longae et 1-2 cm latae base obtuse cuneatae vix vel non acuminatae margine utrinque grosse obtuse 4-6-crenato-serratae apice obtusae supra sparse scabrae et dense scabridulae subtus pallidiores glandulo-punctatae in nervis et nervulis valde scabro-pilosae fere ad basem patentiter trinervatae. Inflorescentiae in ramis terminales corymbosae, ramis hispidulis, ramis ultimis ca. 3 mm longis. Capitula campanulata 7-8 mm alta et 4-5 mm lata; squamae involucri ca. 18 brunnescentes subcoriaceae exteriores non herbaceae subimbricatae minute ovatae vel late oblongae 1.5-7.0 mm longae et 1.5-3.0 mm latae apice rotundatae margine distincte anguste scariosae extus glabrae, canales resiniferis plerumque 7-9; paleae nullae. Flores radii nulli. Flores disci ca. 8; corollae flavae ca. 3.5 mm longae extus glabrae, tubis distinctis ca. 1.3 mm longis, faucis late campanulatis ca. 1 mm longis, lobis 1.3-1.5 mm longis ca. 0.7 mm latis; thecae antherarum ca. 1.5 mm longae; appendices antherarum ovatae 0.3 mm longae et 0.23 mm latae extus glanduliferae. Achaenia 2.5-3.0 mm longa sparse scabridula; squamellae pappi 16-18 ca. 0.4 mm longae et 0.3 mm latae margine et apice erose

denticulatae. Grana pollinis ca. 27 μ m in diam. spinulosa.

TYPE: BRASIL: Bahia: Serra do Curral Feio. 16 km NW. of Lagoinha (which is 5.5 km SW of Delfino) on side road to Minas do Mimoso. Small stream with marsh on white sand, and surrounding cerrado on sandstone rock exposures. Alt. 950-1000 m. Approx. 41°20'W. 10°22'S. Subshrub to 25 cm. Capitula yellow. 8 March 1974. R.M.Harley, S.A.Renvoize, C.M.Erskine, C.A.Brighton & R.Pinheiro 17020 (Holotype US).

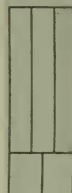
For the distinctions of the species see the discussion under C. harleyi.

Calea barrosoana H.Robinson, nom. nov. Meyeria longifolia DC.

Prodr. 5: 671. 1936. Calea longifolia (DC.) Baker in Mart., Fl. Bras. 6 (3: 260. 1884, not C. longifolia Gardn., Lond. Jour. Bot. 7: 418. 1848. Blake (1930) provided a new name, C. angusta, in a similar situation involving the various species called C. angustifolia, but apparently no name has been provided for Meyeria longifolia whose combination in Calea is preoccupied.

Literature Cited

- Blake, S. F. 1930. Notes on certain type specimens of American Asteraceae in European Herbaria. Contr. U.S. Nat. Herb. 26: 227-263, i-ix.
- Robinson, H. 1975. Studies in the Heliantheae (Asteraceae). VI. Additions to the genus, Calea. Phytologia 32 (5): 426-431.
- _____. 1978. Studies in the Heliantheae (Asteraceae). IX. Restoration of the genus Alloispermum. Phytologia 38 (5): 411-412.



Calea eitenii Robinson, n. sp.

Flora of Brazil
STATE OF MATO GROSSO

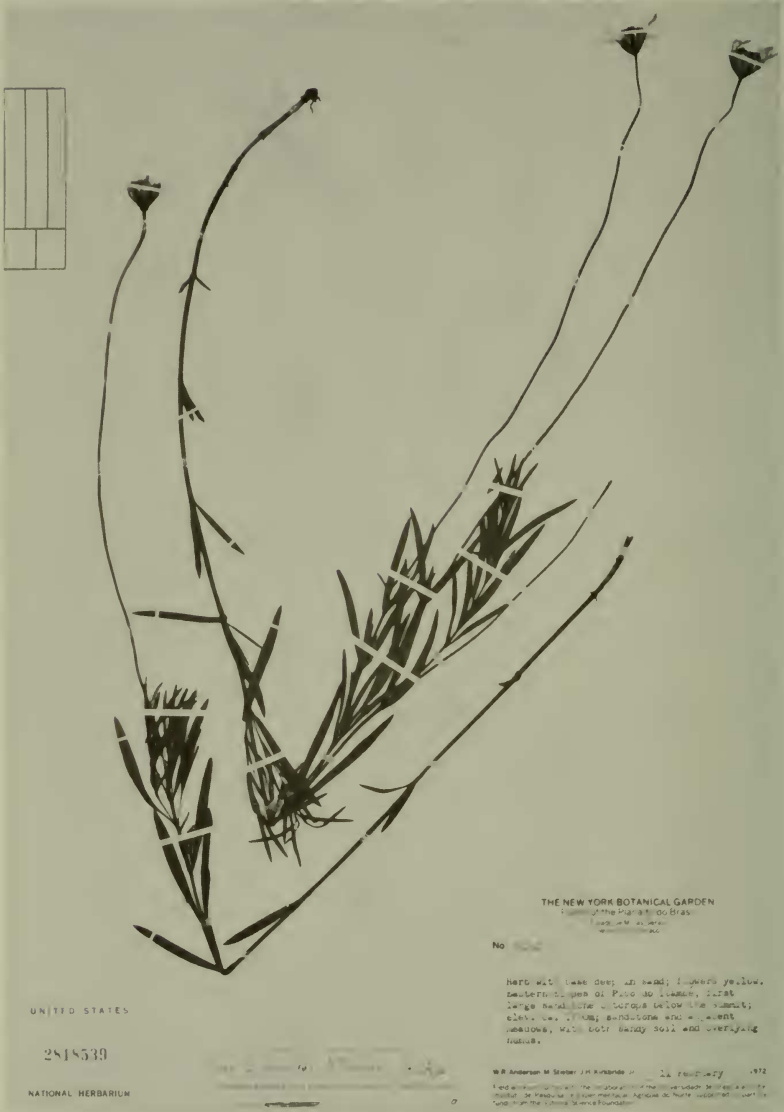
Município de Jaboticatubas: Serra do Cipó,
1 km. road at km 121. 1961-1962. 4385'4.
Alt. ca. 1200 m. Wet grassy meadow on thin
soil derived from quartzite ("itacolomita").
This n. sp. rays golden-yellow. Disk flowers with
yellow petals and orange to brown anthers.
25 Nov 1965
leg. George Eiten & Liene T. Eiten. n° 6891

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Calea eitenii H. Robinson, Holotype, United States National Herbarium. Photos by Victor E. Krantz, Staff Photographer, National Museum of Natural History.



Calea kirkbridei H. Robinson, Holotype, United States National Herbarium.



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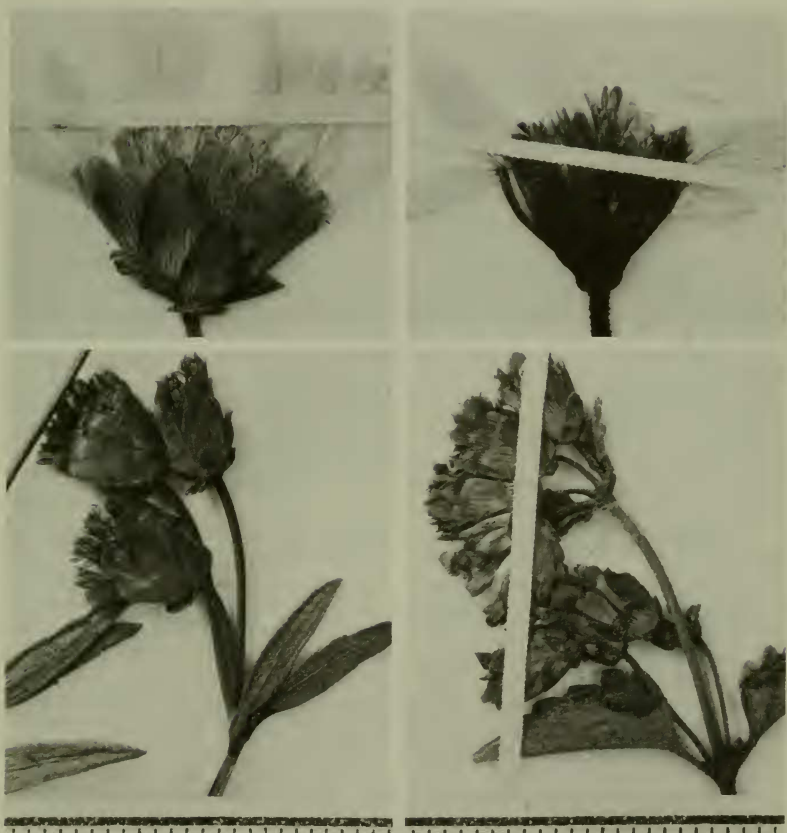
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Calea harleyi H. Robinson, n. sp.
Holotype: United States, California, Monterey Co., 1979

Calea harleyi H. Robinson, Holotype, United States National Herbarium.



Calea pinheiroi H. Robinson, Holotype, United States National Herbarium.



Calea, enlargements of heads: Top left. *C. eitenii*. Top right. *C. kirkbridei*. Bottom left. *C. harleyi*. Bottom right. *C. pinheiroi*.